

AMENDMENTS TO THE SPECIFICATION

In paragraphs [006], [014], [021], [042], [051], [055], [056], [071], [073], [077], [079], [084], [091], [094], [0101], [0103], [0104], and [0106], please amend as reflected in the following marked-up version of the paragraphs:

[006] Known portable showers often utilize a large container for holding the water. Typically, the water is heated within the container and a pump or gravity is used to supply the heated water from the container to the user. A significant drawback of these known portable showers is that the size of the container limits the amount of hot water available to the user. Thus, if more than one person wants to take a shower, each person must refill the container with cold water, and that water must be heated before that person can take a hot shower. Heating the reservoir of water often takes a significant amount of time, especially if a small heat source is being used. Additionally, these conventional portable showers heat all the water in the container at the same time, requiring a substantial amount of heat from the heat source and a large amount of time to heat all the water in the container. Thus, depending upon the size of the heat source and container, it can take up to thirty minutes or more to heat the water in the container for a hot shower. Disadvantageously, the heated water in the container, which is generally poorly insulated or not insulated at all, constantly ~~loses~~looses heat, thereby prolonging the time required to heat the water for a hot shower.

[014] In yet another embodiment, a water heater is provided having a heating assembly which includes an outer housing. The Outer housing 303 has a top wall, bottom wall, two sidewalls, a top cover, and a bottom cover. The heating assembly includes a heat transfer conduit and a fuel burner assembly disposed therein. The heat transfer conduit can be formed from a cylindrical

coiled tubing and disposed about a horizontal axis. A plurality of plates may be disposed in the housing to support components of the fuel burner assembly and heat transfer conduit. In addition, the plates help contain the heat from the fuel burner assembly within the housing and help keep the sides of the housing from becoming too hot. The fuel burner assembly may include one or two burners disposed underneath the length of heat transfer conduit. The burners may be placed outside of the coiled tubing. This embodiment may be useful for large scale applications such as hazardous materials or emergency industrial use. However, it may also be adapted for smaller applications such as personal showering.

[021] A further aspect of the portable water heater is the electrical power required by the pump can be provided by a variety of different sources. Preferably, a battery pack is used to provide electrical power to the pump. Advantageously, the battery pack can include rechargeable or replaceable batteries. Alternatively, electrical power can be supplied by any suitable external power source such as a car or recreational vehicle ~~volt~~-battery. Electrical power may also be supplied to the pump by a cigarette adaptor in a car or boat, or power from the cigarette adaptor may be used to recharge the battery.

[042] Figure 16 is schematic cross-sectional view of the heating assembly of Figure 9.

[051] As depicted in Figure 1, intake 12 and pump 20 are in fluid communication with an intake tube 40. In one embodiment, intake tube 40 is constructed from a resilient flexible material and allows the water to flow directly from pump 20 to a heating assembly 50. Advantageously, pump 20 provides pressurized water for the user and, when portable water heater 10 is being used in conjunction with a shower, the force of gravity is not required to cause the water to flow from water source 11 to a showerhead 134. In contrast, many conventional

portable showers require the user to place a heavy reservoir of water above the individual using the shower and then use the force of gravity to cause the water to flow to the showerhead 134.

[055] Portable water heater 10 also comprises a heat transfer means for transferring the heat produced by a fuel burner 112 (Figure 3) to water flowing through heat transfer means. One example of structure capable of performing the function of such a heat transfer means includes heating assembly 50. In one embodiment, heating assembly 50 comprises heat transfer conduit 56 disposed in housing 52. It will be appreciated various other embodiments of structure are capable of performing the function of such a heat transfer means.

[056] In one embodiment shown in Figure 4, tube 58 includes a plurality of closely spaced coils having one or more different diameters D relative to the longitudinal axis of heat transfer conduit 56 that decrease in length as tube spirals upwardly. In one embodiment, decrease in diameter D of the coils results in heat transfer conduit 56 having a conical-like shape. More specifically, in one embodiment illustrated in Figures 4-6, coiled tubing 58 of heat transfer conduit 56 is generally disposed about a generally centrally located vertical axis 62 within housing 52. A first coil 64 is located proximate the lower end of housing 52 and is attached to sidewalls 53 of housing 52 by bracket 66 (Figure 4). In one embodiment, two brackets 66 are used to ~~attaché~~ attach first coil 64 to the lower end of housing 52. It will also be appreciated that various other numbers of brackets 66 may be used to carry out the function thereof. Brackets 66 hold tubing 58 of first coil 64 in a generally stationary position, but may allow some amount of movement, such as expanding movement, for example, while the water is heated as it flows through portable water heater 10. It will be appreciated that various types of fastening or connecting methods could be used to generally keep tubing 58 of first coil 64 in place with respect to housing 52.

[071] ~~As illustrated in Figure 3,~~ In one embodiment heat source 100 also includes a fuel burner assembly 104, which combusts fuel to create heat in heating assembly 50. Figures 3, depicts one embodiment of fuel burner assembly 104. As illustrated in Figure 3, in one embodiment fuel burner assembly 104 includes a connector 107 which connects fuel burner assembly 104 to fuel source 102 (see Figure 1). As illustrated in Figure 3, connector 107 connects fuel source 102 (see Figure 1) to a fuel conduit 108.

[073] Burner 112 of fuel burner assembly 104 is attached to the second end 108B of fuel supply tube 108 and includes a plurality of openings to release the fuel-air mixture where the flame will occur. Fuel burner assembly 104 is connected to fuel source 102 (not shown) by a connector 107. As illustrated most clearly in Figure 6, in one embodiment, connector 107 is connected to fuel source 102 (not shown) by threads that allows fuel burner assembly 104 to be releasably connected to fuel source 102. Connector 107, as shown in Figures 5 and 6, includes a control valve 110 that controls the flow of fuel from fuel source 102 to fuel burner assembly 104. Control valve 110 has a control knob 110A attached thereto and is disposed in connector 107 to selectively control the flow of fuel through connector 107. A needle 105 extends from connector 107 into the outlet of fuel source 102 (not shown) to enable fuel from the fuel source to flow into connector 107.

[077] In one embodiment, shown in Figure 5, the upper portions of sidewalls 116, 118 of shield 114 are separated by generally the same distance as sidewalls 53 of housing 52 such that heat source 100 can be readily attached to -heating assembly 50. As a result, the upper portions 117, 119 of sidewalls 116, 118 are configured to be inserted into corresponding flanges 126, 128 in housing 52 to create a friction engagement of heat source 100 to heating assembly 50. It will be appreciated that various other ways of attaching shield 114 to housing 52 could be utilized.

[079] ~~Advantageously~~Returning to Figure 5, advantageously, heating assembly 50 and heat source 100 (Figure 2) efficiently heat the water traveling through coiled tubing 58 because burner 112 is located near coiled tubing 58. Further, in one embodiment, because one or more of the coils of tubing 58 decrease in diameter as coiled tubing 58 spirals upwardly, at least some if not all of the lower and upper coils 58 are directly exposed to the heat from burner 112. Alternatively, where coiled tubing 58 forms a generally cylindrical shaped body, coiled tubing 58 allows the heat from burner 112 to flow upwardly past the coils without being impeded.

[084] In greater detail, the carrying case preferably includes a recessed handle and a removable lid. The removable lid is preferably releasably attached to a body of the carrying case by two or more hinges that allow the lid to be removed. The removable lid includes a recessed portion or cavity that is sized and configured to receive all or a portion of water heater 10. In one embodiment, the recessed portion is sized and configured to receive and hold one or more pressurized gas cylinders in an upright position. Advantageously, the lid provides a sturdy and stable base for portable water heater 10, whether or not the lid is attached to the body of the carrying case. A preferred embodiment of the carrying case is disclosed in co-pending United States provisional patent application serial number 60/312,550, filed on August 15, 2001, (~~attorney docket number 15474.5~~), to which was converted into a United States patent application serial number 10/222,732, filed on August 15, 2002 (~~attorney docket number 15474.5.1~~) claims priority and the benefit thereof, which is hereby incorporated by reference in its entirety.

[091] As shown in Figures 9 and 10, ~~11 and 13~~, a heating assembly 302 has an outer housing 303. In one possible embodiment, outer housing 303 is formed by a front wall 304a, rear wall 304b, sidewalls 306a and 306b, top cover 308a and bottom cover 308b. As shown in Figures 12

and 14, respectively, walls 304a, 304b, 306a, 306b form a top opening 305a (Figure 12) and a bottom opening 305b (Figure 14) . A top cover 308a (illustrated in Figure 10) is configured to be disposed over the top opening 305a and a bottom cover 308b (shown in Figure 11) can be disposed over the bottom opening 305b.

[094] Returning to Figure 10, front wall 304a may include a plurality of holes ~~338~~ to allow portions of components of the burner assembly and/or heat transfer conduit to be accessible outside outer housing 303, which will be discussed in more detail below. Outer housing 303 may include other features not shown in the embodiment of Figures 9 and 10, including, but not limited to, a handle, apertures in outer housing 303 for releasing heat, apertures for connecting portions of outer housing 303 together, and the like. Furthermore, it will be appreciated that outer housing 303 may have various other configurations for performing the functions described herein.

[0101] As most clearly shown in Figure 13, in another embodiment, heat transfer conduit 316 is positioned in and mounted in a chamber 328 formed in outer housing 303. Chamber 328 is at least partially formed by two side plates 330a, 330b, a front plate 330c, and a rear plate 330d. The chamber 328 provides locations to connect portions of heat transfer conduit 316 ~~(Figure 13)~~ and/or burner assembly 340 (Figure 15). Side plates 330a and 330b support heat transfer conduit 316 as described below. Plates 330 can also provide added structural support to outer housing 303.

[0103] Plates 330 also assist to return the heat near heat transfer conduit 316 and can also serve to partially insulate the walls of outer housing 303. By retaining the heat generated by the fuel burner assembly 340 (Figure 15) toward heat transfer conduit 316, and insulating at least a portion of the heat produced by the fuel burner assembly from reaching the front wall 304a, rear

wall 304b, and side walls 306a, 306b. ~~P~~lates 330 help reduce the amount of heat that reaches outer housing 303 so as to keep the surface of outer housing 303 cooler during operating of water heater 300. Plates 330 thereby increase the safety of the water heater 300 by reflecting the heat produced by the fuel burner assembly away from outer housing 303 so that outer housing 303 is not the primary point of heat contact. Plates 300 can be constructed of the same or different material as outer housing.

[0104] As shown in Figure 13, side plates 330a and 330b can be connected to side walls 306a, 306b by, for example, outwardly curved portions formed at the ends of the side plates. In one embodiment, front plate 330c is disposed across the opening formed by the legs 311b of rear portion 310a. The ends of front plate 330c are connected to optional lips 312a, 312b of rear portion 310a. It will be appreciated that front plate 330c could be attached to outer housing 303 in various other locations and manners. In the embodiment illustrated, rear plate 330d includes an upwardly bent rim 331. Opposing ends of the rim 331 are connected to side plates 330a, 330b. It will be appreciated by one skilled in the art that various other configurations of rear plate 330d could be used. Further, rear plate 330d could be attached to side plates 330a, 330b in various other manners known in the art. Finally, when top cover 308a (Figure 12) and bottom cover 308b (Figure 14) are placed over top opening 305a and bottom opening 305b, respectively, chamber 328 is formed. Connection between the various components of chamber 328 can be made by welding, bolting, riveting, and the like.

[0106] In one embodiment illustrated in Figure 14, the bottom region of rear plate 330d includes optional channels 356 so that portions of burners (discussed below) of burner assembly 340 can extend therethrough and be connected to rear wall 304b (Figure 13) of outer housing 303. Brackets 348 are provided for securely connecting the burners to rear wall 304b. Also shown in

Figure 14, bottom region of side plates 330a, 330b include notches 364 formed therein. When bottom cover 308b is placed over the bottom opening 305b, the notches 364 allow heat from chamber 328 to escape therethrough.